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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

NYE:jb:bl:9-21-81:(1417N)

M/S 521

SEP 25 1981

Mr. G. N. Nelson
SOHIO Alaska Petroleum Company
Pouch 6-612
Anchorage, Alaska 99502

Dear Mr. Nelson:

We have evaluated the August 24, 1980 request to allow the construction of non-permitted sources at Gathering Center No. 3 under the no net increase provision as stipulated in the Prevention of Significant Deterioration (PSD) regulations (Section 52.21(b)(3)(i)).

Our technical staff concurs that the horsepower, emissions and air quality impacts from the proposed equipment will be offset by not constructing a 17 MHP turbine at Gathering Center No. 3 permitted by PSD permit No. PSD-X79-05. Since there is no net increase in emissions and since the new units will still be subject to the emission limitations and the compliance demonstrations outlined in the PSD permit PSD-X79-05, independent PSD review for the equipment identified in the August 24 letter is not required.

In order to implement the requested changes, PSD permit No. PSD-X79-05 needs to be modified. This letter hereby grants you authorization to change the following PSD permit:

PSD-X79-05
On page 1 of 5, line 27, change five to six.

Additional public pariticipation in accordance with the PSD regulations will not be required for this permit modification.

If you have any questions, please feel free to contact Michael Johnston of my staff at (206) 442-7176.

Sincerely,

/s/sJohn R. Spencer

John R. Spencer
Regional Administrator

cc: P. B. Norgaard, ARCO
S. Hungerford, ADEC
[illegible] Wagner, SOHIO
J. Sweeney, AOO

	CONCURRENCES						
SYMBOL							
SJRNAME							
DATE	JOHNSTON 9/22	GEREN 9/23	REED	COATE			

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Ray

SOHIO ALASKA PETROLEUM COMPANY

3111 "C" STREET
ANCHORAGE, ALASKA

TELEPHONE (907) 276-5111

MAIL: POUCH 6-612
ANCHORAGE, ALASKA 99502

August 24, 1981
cc #38,508

Regional Administrator
Region X
U.S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, Washington 98101

Attention: Mr. Michael Johnston

Subject: REQUEST TO EXCHANGE AIR EMISSION SOURCES IN THE PRUDHOE BAY OIL FIELD

Dear Sirs:

As a result of recent engineering studies, Sohio is planning to install additional turbine capacity at Gathering Center No. 3 (GC-3) to provide gas lift capabilities that will improve oil production from various wells. Although there is adequate total turbine capacity covered under existing PSD permits at GC-3, there are no uncommitted turbines of the size range required for this project. It is proposed that the emissions from a 17 MHP turbine permitted at GC-3 under PSD-X79-05 be exchanged for 10 MHP total turbine capacity at the same location. Final turbine selection has not been made at this time but the individual turbine size will range from 3.5 MHP to 5.0 MHP. The turbines will be gas-fired. One turbine will be ordered in late September, 1981 with a second turbine as contingency if design changes dictate.

Therefore, it is requested that EPA, Region X consider for approval the proposed exchange of air emission sources for the following reasons:

1. To counteract the increase in emissions and air quality impacts from the proposed facilities, one 17 MHP gas fired turbine permitted under PSD-X79-05 will not be installed.

2. There will be a net decrease in air pollutant emissions as a result of the proposed exchange of emission sources.

3. Both the proposed facilities and the permitted 17 MHP turbine are located at GC-3.

4. The proposed turbine capacity will be gas-fired and will satisfy the requirements of the New Source Performance Standards for Gas Fired Turbines promulgated on September 10, 1979.

5. The change in air quality impacts resulting from the exchange in turbine capacities is not significant.

Additional technical justification pertaining to air quality impacts as well as proposed turbine emissions data and stack characteristics are attached.

Financial commitment for the proposed facilities is planned for late September, 1981. To meet these commitments and maintain current project schedules will require an approval of our request by September 15, 1981. If you so desire, we would be pleased to discuss this request in further detail at your convenience.

Very truly yours,

Mark R. Wagner

Mark R. Wagner
Environmental Engineer

Attachments

cc: Mr. Stan Hungerford, ADEC - Juneau
Mr. Doug Lowery, ADEC - Fairbanks
Mr. Jim Sweeney, EPA - Anchorage

MRW/kg

ATTACHMENT I

Turbine Emissions Data and Stack Characteristics

LOCATION	DESCRIPTION	UTM COORDINATES EAST (km)	UTM COORDINATES NORTH (km)	POTENTIAL EMISSIONS NO_x (g/s)	STACK CHARACTERISTICS HEIGHT (m)	DIA (m)	VEL (m/s)	TEMP (^{o}K)
GC-3	17 MHP turbine permitted under PSD-X79-05	436.7	7798.5	8.81	16.7	2.69	35.0	755
GC-3	*Proposed 10 MHP turbine capacity	436.7	7798.5	7.69	22.2	0.91	33.2	450

* This total capacity will be attained with multiple turbines with individual capacities ranging from 3.0 MHP to 5.0 MHP. Stack characteristics are from a 3.5 MHP turbine.

ATTACHMENT II

Air Quality Impacts Analysis

The Texas Climatological Model (TCM) modeling results presented in the Radian Technical Note:

Air Quality Impacts in the Prudhoe Bay Oil Field Resulting from an Exchange of Emissions Sources, December 3, 1980 can be used to demonstrate the effects of the proposed turbine emissions exchange on maximum air quality impact receptor areas. In the 1980 Analysis two equipment design cases were examined, a worst impact scenario and a least impact scenario. In this anaylsis, for example, all 4 MHP turbines were modeled with the stack characteristics of 2 MHP turbines with waste heat recovery (worst impact) as well as with stack characteristics of a 4 MHP turbine with no waste heat recovery (least impact). The least impact scenario maximum impact receptor occurred in the Deadhorse area with a predicted NO_x concentration of 71.40 $\mu g/m^3$. For the worst impact scenario, also in the Deadhorse area, the predicted concentration was 71.70 $\mu g/m^3$.

The results of the modeling analyses presented in the 1980 Analysis show that the proposed exchange described in this letter should have no significant impact on maximum expected pollutant concentrations in the Prudhoe Bay area. Only a small difference (less than 1 percent) in NO_x concentrations is predicted at the Deadhorse area maximum impact receptor between the worst-impact and least-impact scenarios described in the 1980 Analysis. For the following reasons, this concentration difference should define an upper bound to the increased effect of the 1981 turbine exchange proposed here.

1. The NO_x emissions affected by the worse-case and least-case stack parameter scenarios described in the 1980 Analysis were 96.8 g/s compared to 7.69 g/s affected by the turbine exchange proposed here. Therefore, the very small difference (.3 $\mu g/m^3$) in concentrations at the maximum impact receptor due to the two different scenarios is based on NO_x emissions over 12 times the magnitude of those affected in the 1981 proposed turbine exchange.

2. Significant differences exist between turbine stack parameters described for for each scenaio in the 1980 Analysis. For example, 25 MHP of the turbine capacity affected was modeled with 36 MHP turbine parameters for the least impact scenario and with 16 MHP parameters for the worst impact scenario. And, 15 MHP of turbine capacity was modeled with the parameters of 7.5 MHP turbines and 5 MHP turbines under the least impact and worst impact scenarios, respectively. These stack parameter differences are not as large as those noted for the 17 MHP turbine and 10 MHP turbine capacity affected in the turbine exchange described in this letter. However, since a much larger quantity of NO_x emissions are affected in the 1980 Analysis, the overall differences in air quality impacts reported in that study should be greater than those resulting from the 1981 turbine exchange.

3. The turbines affected in the 1981 turbine exchange are located about 11.2 km northwest of the primary maximum impact receptor in the Deadhorse area and about 4.5 km southeast of the secondary maximum impact receptor in the Prudhoe Bay Oil Field area. All previous modeling results for Prudhoe Bay PSD permitting show that sources not located in predominant upwind directions from receptors have little effect on those receptors. Since GC-3 is not upwind (east-northeast or west-southwest) of the Deadhorse or the Prudhoe Bay Oil Field maximum impact areas, emissions from either the 17 MHP or the 10 MHP turbines should have minimal effects on these receptors. In addition, the great distance separating GC-3 from these receptor areas minimizes the effects of GC-3 turbines.